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ABSTRACT

The third and final unit of the 4-H Outdoorsman Program covers the most advanced and challenging campcraft skills for 4-H members in British Columbia, Alberta, Saskatchewan and Manitoba. Survival camping (including building shelters and finding food), in-depth map-reading and orienteering, game management, hiking themes and recordkeeping are all discussed at some length. Achievement Day projects and activities are outlined for the display kit for Unit III. Metric conversion tables are provided. (JMM)

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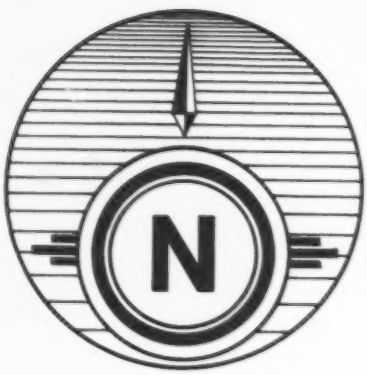

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CANADA

Unit III
WP 472-78

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This Manual is produced for 4-H members and leaders enrolled in the 4-H program and administered by:

The British Columbia Department of Agriculture
4-H Clubs Branch

Alberta
AGRICULTURE

4-H Branch

The University of Saskatchewan
Extension Division

The Manitoba Department of Agriculture
4-H and Youth Section, Community and Family Programs Branch

4-H MOTTO

"Learn to do by doing"

4-H PLEDGE

I pledge
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to larger service,
My HEALTH to better living,
For my club, my community and my country

4-H GRACE

(Tune of Auld Lang Syne)

We thank thee, Lord, for blessings great
On this, our own fair land.
Teach us to serve thee joyfully,
With head, heart, health and hand.

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Introduction

Your work in Units I and II has been basic training for this last Unit. The greatest challenges in the outdoors lay ahead; survival camping, map-reading, orienteering, and games management. Through such specialized activities you'll come to understand and appreciate the outdoor world, in all its wildness and beauty.

Achievement Day Requirements Unit III

1. Complete record book, project meetings and special activities sheets.

2. Complete at least one of the "survival" activities.

3. Display sketches or photos of edible berries. Display sketches or photos of poisonous berries.

4. Present an environmental study.

5. Complete map and compass exercises.

6. Complete a food chain study.

You may want to develop an outdoor kit or display book as you did for Units I and II.

As in previous units, two symbols will be used.

The maple leaf to designate Achievement Day Exercises.

The butterfly to designate Fun Time action projects.

Survival Camping

Survival camping or camping th only the bare necessities need not be a hardship. Nature is where man came from, it should and can be his home. It is an asset to your life to be able to leave the hectic world of modern civilization and go into the wilderness alone or with some friends and live with the forest, using all its gifts and to come out relaxed and maybe healthier than when you went in.

Survival has two important parts: (1) Being prepared ahead of time; (2) Making the most of your situation once you find you're in difficulty.

By studying about survival, you are preparing yourself. If you follow a few simple rules you can avoid most of the situations which cause people trouble.

1. Always let someone know what your plans are before you start off on a hike or trip. Then, if you fail to return in a reasonable time, people can start looking for you.

2. Take the things which you will need; especially waterproof matches, knife, water, food, clothes, small waterproof compass, flashlight in a waterproof container, axe.

3. Be observant. Notice landmarks and the like.

4. Stay away from hazards, such as old mine shafts and caves.

5. Be calm. Panic is your worst enemy. Sometimes there is nothing you can do but wait. For example, fog might close in, leaving you without landmarks or a reliable sense of direction. If that happens, just make yourself as comfortable as possible and wait for a break.

Man is unlike any other animal on earth. He can think. He can reason. If you are lost in the woods, or anywhere else, you may need to <u>improvise</u> (make what you need with what you have).

WHAT TO DO WHEN LOST

Keep your head; stop, sit down; and think. Then:

1. Look For and Make a Shelter - don't wait too late; darkness may overtake you. Fallen trees, caves, boughs, snowdrifts will provide shelter. Get out of the wind, keep warm by the fire and protect yourself from the ground cold by layers of leaves or boughs.

2. Make Signals For Rescues - build signal fire, make tracks if you're in snow, blaze trees, fire three shots, three blasts on a whistle, mark your locations by blazing trails out in all directions. If you must move, leave a message as to the direction you have taken, mark your trail by blazing trees, using cloth markers, or breaking twigs.

3. Get Water - it's more important than food. Use streams, lakes, heavy dew, catch rain, melt snow, use Halazone tablets to purify it at one per litre.

4. Search For Food - animals, birds, fish, barks, fruits, and some plants. If you are not sure - eat it only as a last resource. Set snares and traps.

Be sure to mark your trail so you can return to your emergency shelter - rest - sleep - stay put - think - conserve your energy. Don't give up! Help will come.

SURVIVAL KITS

Next, the subject of equipment. Study the equipment and many survival kits which have been made in the past for airmen, explorers, and persons who ventured into the wilderness. Then, eliminating unnecessary items add others to make up your own. It is to be used for emergency only, when and if that time does come. It is easy to make for yourself, or may be purchased commercially. The following list suggests the essential basics. Would you add any items for your own use?

SURVIVAL KIT CHECK LIST

SUGGESTED:	YOUR ADDITIONS:
halazone tablets (water purification)	
bouillion cubes	
dehydrated soups	
cocoa in foil	
60 grams sugar	
2 teabags	
high energy food such as chocolate bars, dried fruit	
water-proofed matches	
flint and steel	
2 - 25 cm squares heavy aluminum foil	
small compass (emergency)	
antibiotic tablets	
antiseptic	
pain killer (222)	
single-edged razor blade	
pocket knife	
needle, thread, buttons	
10 metres of 36 kg test nylon fish line	
fish hooks	
4 metres snare wire	
small mirror	
whistle	
insect repellant	
writing paper (leave emergency message)	
pen or pencil	

PRACTICE SURVIVAL TRIP

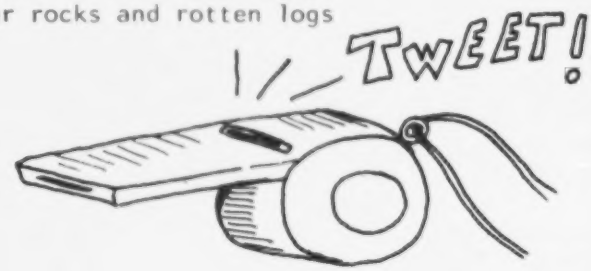
If you really want to prepare yourself for a survival experience try a "survival trip" of your own. Get a buddy or two, preferably men who have some woodcraft skill, let someone know exactly where and when you are going and when you will be back. Follow the four basic principles outlined. Make it realistic, but not too tough for the first try. Summer time is best for a starter. Assuming that you carry a survival kit, here are a few hints for either your test survival trip or the real emergency just in case it happens to you:

Use some of your emergency food during the first few hours you are "lost" and before you set your emergency snares or use your fishing equipment. Eat slowly. This will also serve to steady your shaken nerves and give you added confidence.

When building a fire, strike your matches on as dry a surface as you can find. Hold the match head down rather than up. Gather tinder and firewood and place in a dry place. In winter particularly gather twice as much as you think you will need in order to have enough. Use small branches or squaw wood for tinder, larger standing dead trees for firewood. Avoid all unnecessary exertion. Save your energy.

Keep your compass clear of metal objects. Use trees, rocks, or prominent objects at a distance to keep on a straight course. In thick areas, check your compass more frequently. Follow streams down current, they will lead you to larger streams, lakes or civilization. Blaze your trail by breaking twigs, marking trees, or tying bits of cloth on branches or shrubs. Don't move your camp unless you have to. Your chances of being found are much better if you will "stay put". If you must move your camp, leave a message as to the direction you have taken, time and day left, your general condition etc.

When assembling fishing equipment be careful to tie it securely. Cut a live sapling for a fish pole. Look under rocks and rotten logs for bait. Practice making snares and traps.



Fasten your whistle around your neck or to your belt with cord so you won't lose it. Then it will always be ready to answer your rescuers' call, 3 sharp blasts for help!

Take care of small cuts, abrasions and particularly blisters and avoid infections by using an antiseptic, bandaids and tape. Severe cuts may be drawn together by sterilizing a short strip of adhesive in the center and drawing the wound together with the tape. Sterilize your handkerchief with the fire and cover the wound. Your belt or handkerchief will serve as a tourniquet to stop severe flow of blood but be sure to release it often. Avoid extreme exposure to sun and sunburn; keep covered. In a cold climate keep as dry as possible - dry out clothing immediately to avoid freezing.

Make a cup from your aluminum foil for drinking or boiling water. Use double thickness. Make yourself some hot bouillon. Use Halazone tablets or boil your water to purify it if you question its source.

Make snares with wire and cord and a bent sapling. Use a figure "4" dead-fall to catch small game. Look for the many foods available in your area such as fruits, nuts, birds, barks, plants, animals, fish buds, eggs, snakes, grubs, worms and bugs. When you become really hungry, all of these begin to look good.

Don't be afraid to sleep if the weather is cold. Except in very extreme temperatures of -1°C to -10°C, you will be awakened by the cold long before you freeze. Loosen your clothing for better circulation in cold weather. Walk slowly, keep dry both inside and out. Brush off snow before it melts, dry out wet clothing.

If you have no shelter or if a storm comes up quickly dig a hole in the snow or build a large fire on logs and melt a hole in the snow for protection. Use overturned stumps or large rocks to reflect the heat from the fire. Large dead tree tops or brush piles afford plenty of heat, firewood, and protection. Don't drink alcohol; it increases the risk of frost bite and numbs your senses. You will not be as alert to dangers. Eat snow only sparingly. Melt snow outside the body by fire or sun, conserving body heat.

On your return, spend some time talking over what you did and what you could have done better. If a real emergency arises after you have actually had such a practice survival experience. You will be much better prepared both physically and mentally to meet the situation and come out of it alive and healthy.

Make a habit of these few simple precautions by carrying with you certain essential equipment and by preparing yourself both physically and mentally in the "know-how" of wilderness survival.

SHELTERS

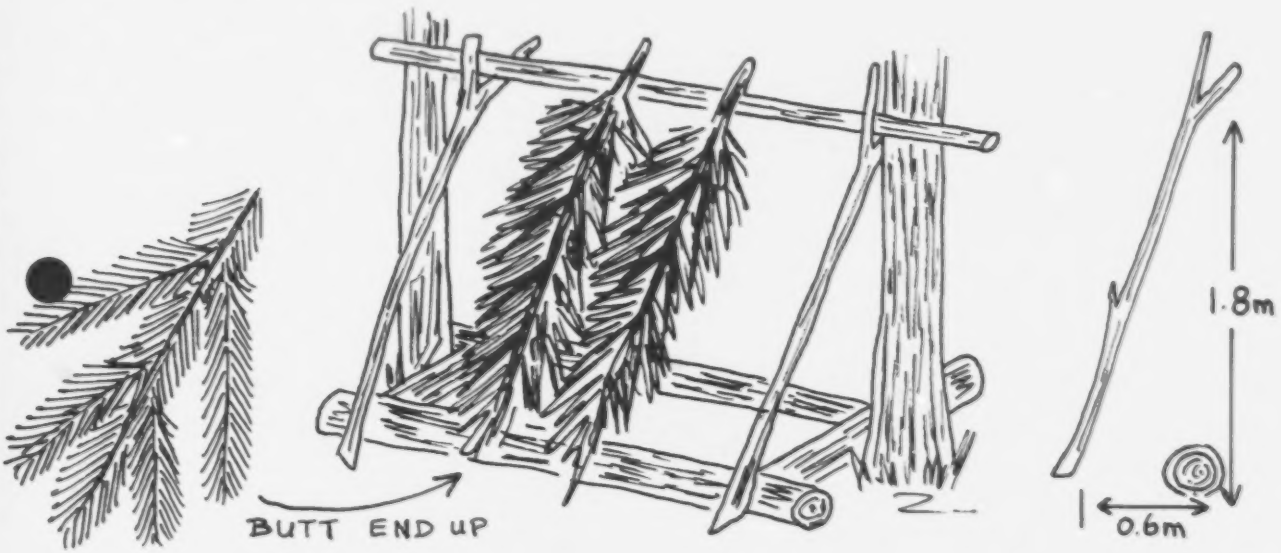
Here are several ideas for improvised shelters. You should only use these when survival camping due to the necessity of trees.

The Classic Lean-to

The traditional lean-to is a framework of poles lashed together and thatched with a slough hay. spruce boughs or any other available material.

Care must be taken every step of the way, to make your lean-to water-proof. The frame should be about as tall as the person sleeping in it, and a little deeper than the person is wide. This is important. A person sleeps lengthwise in the lean-to, head at one end, and feet at the other. It should be quite sturdy, with enough cross members to hold the first evergreen boughs.

Sometimes you can get away with putting only the cross bar up, and leaning evergreen trees whose branches have been trimmed off on one side, against it. The crossbar itself can be tied up between two trees with belts or ropes, but using the forked sticks is much better. The weight of the boughs is then supported by the trees.



Thatching a lean-to is much like shingling a house. First a thin layer of large boughs is put on to form a base, for the other evergreen boughs to be plugged into. Then, starting from the bottom, evergreen boughs are plugged in, butt end up. From side to side you work, putting on boughs overlapping the row below. Try to keep the layer even, judging by the light filtering through the lean-to. Once one layer has been completed, start at the bottom again and put another layer on. Keep doing this, until almost no light shows through. Thin spots can be filled up. Always put the butt end up!

When the rain falls, the water is passed from needle to needle, until it hits the ground, outside of your lean-to. This is why you need lots of needles on your roof, and the least wood or stem as possible. Use only spruce or fir, never pine. Use only the tips of the branches, or the rain will just run down the stem, onto your sleeping bag.

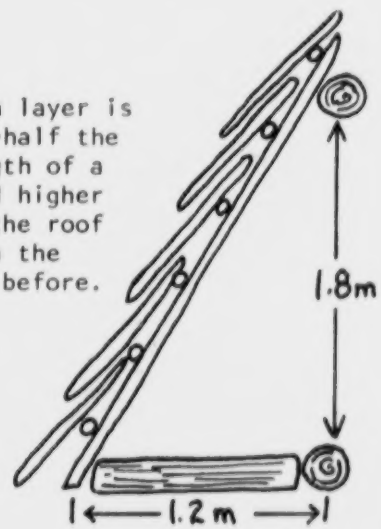
Walls at the side can be filled in the same way. You may want to put logs all around the inside of your lean-to, to define the boundaries a little better, and to keep things in place. Boughs sticking into the interior of the lean-to can be cut off or tucked in.

Bullrushes can also be used to cover a lean-to. Generally they are more waterproof than evergreen ones, and involve less work.

The frame can be almost twice as deep for the same height as an evergreen lean-to. To cover the frame, again start from the bottom and put a layer about 4 reeds thick all along it. Once that is on, move up the lean-to like this, overlapping each reed, right to the top.

There should then be two layers of reeds four reed thick over the entire roof, except the very bottom, and three layers at the joints.

Each layer is one-half the length of a reed higher up the roof than the one before.



The sides can also be filled, but be sure any water running down to the sides from the roof will run onto a reed; tuck them under the roof reeds. Make a smooth corner, not a jagged edge.

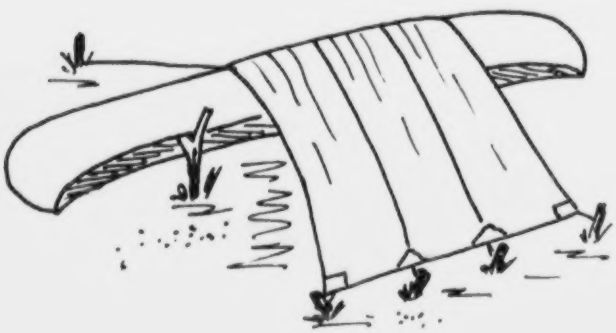
Emergency Lean-to

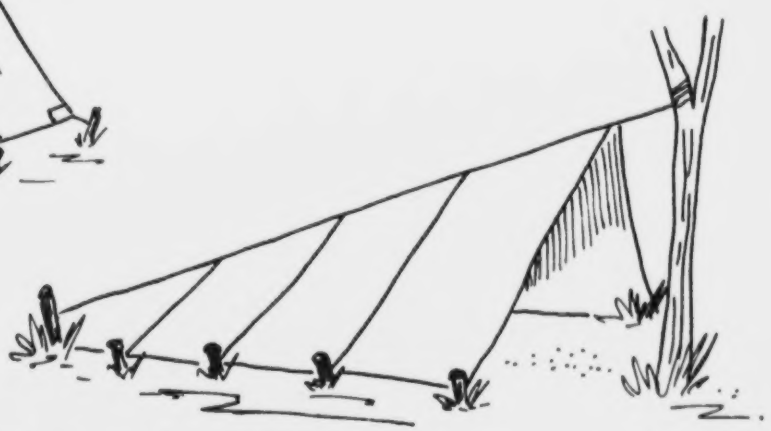
The traditional lean-to requires both tools and time to erect. A very simple lean-to can be built by sawing part way through the trunk of a small spruce tree with a rock and bending it over to break it. Strip the branches off the underside of the trunk and use them to thatch the roof along with limbs torn off other trees.

The Tarpauline Shelter

The possibilities that reside in a large flat tarpaulin are limited only by your imagination. Many canoe campers never use a tent. They purchase instead, a tarpaulin and have grommets sewn along the edges and tie tapes at strategic points along one surface. (You could use the poncho you made in Unit I.)

This versatile rig can be made into a lean-to, a wedge tent or merely draped over an overturned canoe for a night's shelter.

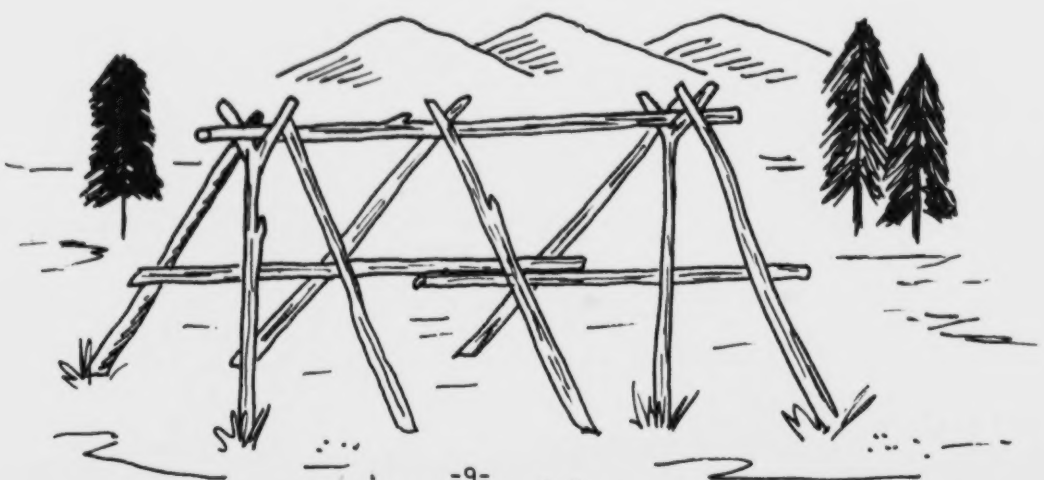




Polyethylene Shelters

Where weight and bulk are problems to be considered, the polyethylene shelter may be the answer. Many hunters merely carry a folded square of heavy polyethylene sheeting such as is used in construction work. This material can be used to quickly erect a waterproof lean-to or wedge tent in the event of rain. When folded it takes up very little room in your pack.

Here's another way to construct a shelter:



FINDING FOOD

ANIMALS

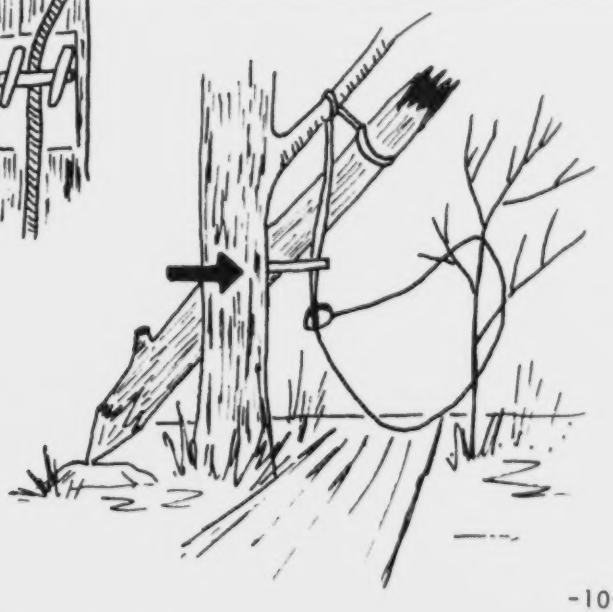
Animal food is generally more nourishing than wild plant food and often more available. Quantity and quality of animal food is present in most environments. Examples are fish, deer, moose, elk, ducks, partridge, birds, rabbits, beaver, bear, porcupines, frogs, gophers, skunks, muskrats, crabs, mice, insects and many more.

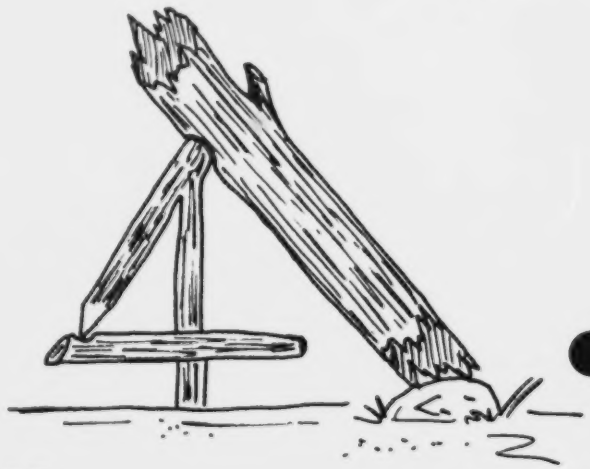
Tracking, hunting, trapping, snaring and fishing are means of getting your food.

Example: A partridge can be snared with a snare attached to a long stick off a tree. A shoelace can be used in place of a snare if one is not available. If other members are present, they can bark like dogs around the trees upon which the partridge is perched. Partridge will stay in the tree and snare easily.

Traps - The easiest type of trap is the "dead fall" trap. It should be placed at the entrance to a burrow or hole, or in the trail used by a small animal. The following illustrations show two ways in which small animals can be trapped. These are only to be used in cases of survival.

GAME LAWS STRICTLY PROHIBIT THE CONSTRUCTION OF SUCH TRAPS FOR AMUSEMENT.



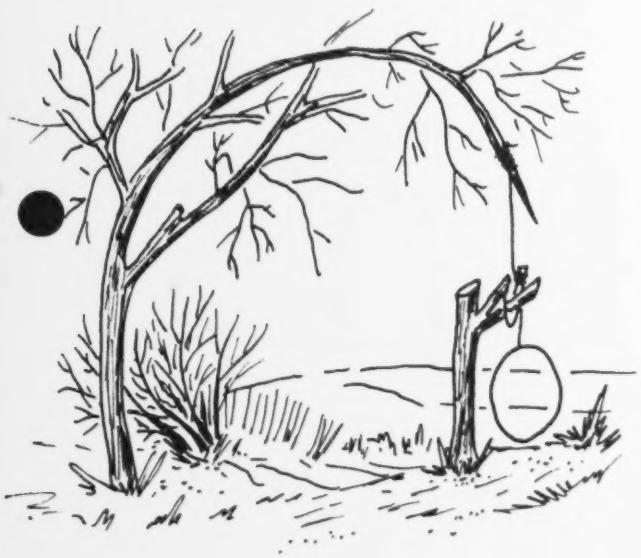


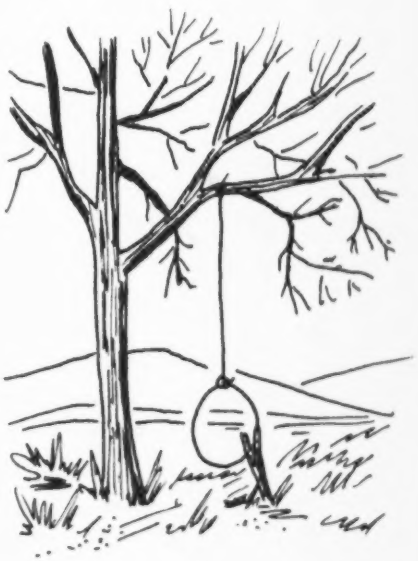
Snares

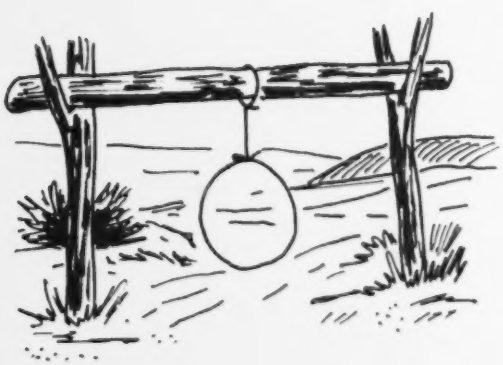
Snares provide a pretty simple means for catching small animals such as rabbits and squirrels for food. A snare is just a slip noose which automatically tightens about the neck of any small animal which passes through it.

The size of the snare depends on the size of the animal you're trying to catch. With something as light as horsehair or thin fishing line, squirrels and rabbits can be caught. The HUDSON'S BAY COMPANY, in it's own emergency kit suggests: "...on a rabbit trail the loop should be about 10 centimetres in diameter and hang from three to eight centimetres above the ground".

The illustrations below show several different snare arrangements.







REMEMBER: IT IS CRUEL TO SNARE ANIMALS JUST FOR PRACTICE OR FOR THE FUN OF IT. SNARES SHOULD BE USED ONLY IN EMERGENCY SURVIVAL SITUATIONS.

Fish Hooks and Lures

Fish can be caught with any number of simply made hooks and lures. Some ways you might make fishing gear are shown below.

PIN HOOK

TWIG HOOK

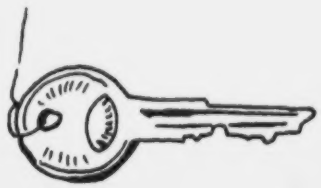
BONE HOOK

CAN OPENER HOOK

COIN LURE

FEATHER LURE

FRAYED LACE LURE



KEY LURE

DISCOVERING THE WILD BERRY

Using this chart, list the varieties of berries found in your area which would be edible in a survival situation.

NAME:	WHERE FOUND:	NAME:	WHERE FOUND:

Circle those berries which you have eaten. Be absolutely certain that you know the berry is edible before you eat it!

Maps

A map is a special drawing of the earth's surface as seen from directly above. It may show only a few features, or a great many, depending on the purpose for which it was made. Maps are made by what is called the traverse method. Basically this is:

1. setting up a network of precisely located markers over the area to be mapped.

2. measuring and recording angles and distances from these to locate whatever features are to be mapped.

3. later, transferring this information to map sheets.

Before aerial photography came into common use during World War II traversing was the way most maps were made. It is still the best technique for mapping small areas. For large areas, photographs taken from planes now provide most of the data needed. Advanced forms of traversing, including the use of electronic instruments, are used to check and adjust the measurements derived from photographs. These developments have made much more accurate mapping possible.

Maps are made for many purposes. There are road maps for travellers, nautical charts for sailors, weather maps for pilots, timber type maps for foresters, and many others. The most useful all purpose maps are the topographic maps. They show all natural and man-made features, and can be adapted for almost any use. Unless otherwise noted, they will be the kind referred to.

SCALE

The most important feature of a map is the scale. It must be known before any map can be useful. A map in a small scale shows a large amount of territory per square centimetre (e.g. an atlas page showing all of North America), but with little detail. One in a large scale shows only a small portion of the earth's surface per square centimetre.

Scale is usually expressed as a fraction (e.g. 1:20,000 which means that one centimetre on the map equals 20,000 centimetres or 200 metres on the ground), or as a ruler or bar by the margin, showing what distance the bar represents on the ground. Topographic maps carry both, with a bar each for metres and kilometres. By using a ruler and one of these bars, you can find the distance between any two points.

Topographic maps come in the following scales:

1:20,000 - (0.2 km/cm), available for limited areas only;
1:50,000 - (0.5 km/cm), available for most of Canada;
1:100,000 - (1.0 km/cm), available for most of Canada;
1:200,000 - (2.0 km/cm), and,
1:500,000 - (5 km/cm)

Just by comparing these figures, you can see why scale is so important. Imagine that in preparing for a hike, you are looking at a map which you think has a scale of 1 cm = 1 km. You see a nice lake which is 4 cm from the road, or about 4 km away. You start walking toward the lake, and, after 3 hours, wonder why you have not reached it. When you check the scale, you find that it is actually 1 cm = 4 km. Hence you have picked a lake 16 km from the road, and have walked about 8 km. This can easily happen when working with maps of different scales. Whenever you look at a map, always check the scale!

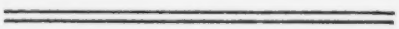
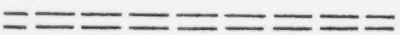
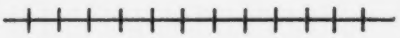
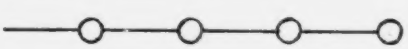
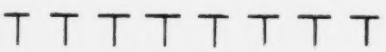
MAP SYMBOLS

Details are shown on maps by means of symbols or signs. These are standard from map to map, and are usually printed in various colours. Thus BLACK indicates all man-made features such as bridges, roads, railways and towns, plus boundaries and place names. BLUE identifies streams, rivers, lakes, and swamps, as well as ice-fields or snow-fields. Land forms such as hills, valleys and mountains are signified by BROWN, and RED denotes main highways and electric power lines. Forests and orchards are represented on some maps by GREEN tree shapes, and by solid green on others. The WHITE areas near roads and surrounded by trees or green are usually agricultural areas; in remoter areas, they may mean rock barrens.

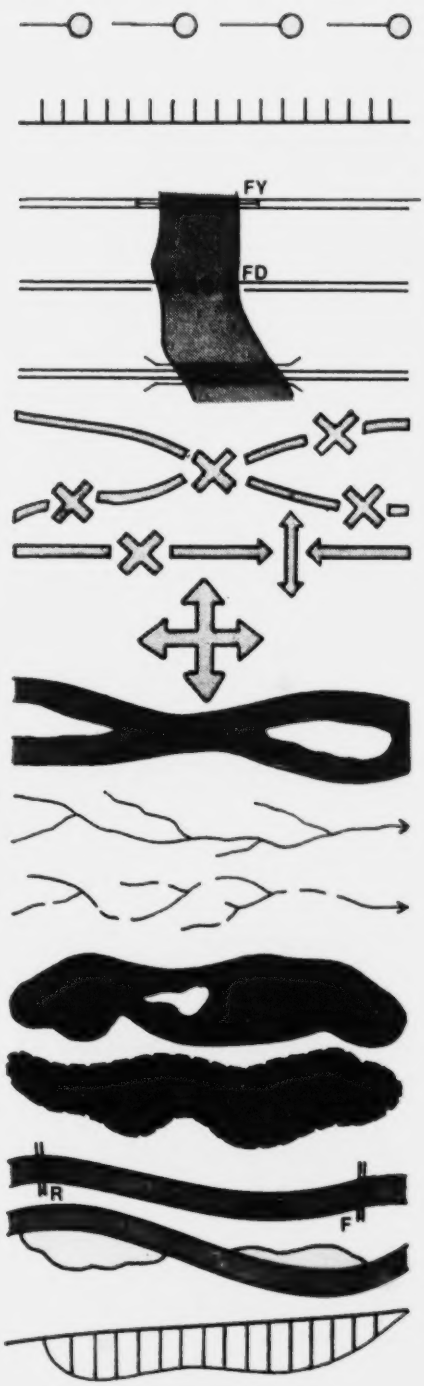
MAP SYMBOLS

COLOR KEY

R - Red
Gn- Green
Gr- Gray
Bl- Blue
Bk- Black

R	HIGHWAY PAVED - GRAVELLED	
R	ALL WEATHER ROAD - GRAVELLED	
R	DRY WEATHER ROAD - DIRT	
R	TRUCK TRAIL -	
R	SEISMOGRAPH LINE OR TRAIL -	
Gr	GAS FIELD BOUNDARY	
Bk	RAILWAY	
Gr	TOWNSHIP LINE SURVEYED	
Bk	TOWNSHIP LINE UNSURVEYED	
Bk	SECTION LINES	
Bk	QUARTER SECTION LINES	
Bl	PARK BOUNDARY	
Gr	TRANSMISSION LINE	
Bk	TELEPHONE OR TELEGRAPH LINE	

Gr	PIPE LINE
Bl	DITCH CANAL OR FLUME
R	FERRY
R	FORD
R	BRIDGE
Gn	HEIGHT OF LAND
Gn	SADDLE IN HEIGHT OF LAND
Gn	HILLTOP OR MOUNTAIN TOP
Bl	RIVER OVER ONE CHAIN WIDE
Bl	CREEK UNDER ONE CHAIN WIDE
Bl	INTERMITTENT CREEK
Bl	LAKE
Bl	LAKE - INTERMITTENT
Bl	RAPIDS OR FALLS
Bl	GRAVEL BAR, SAND OR MUD
Bk	CUT BANK



R	TELEPHONE OR TELEGRAPH LINE - FORESTRY	
Gn	FOREST COVER TYPE	B4ASw
Gn	SAWMILL - PORTABLE AND CLEARING	M.S.
R	AIRSTRIP - USABLE	
R	AIRSTRIP - CONDITION UNKNOWN	
R	FOREST OFFICE	Edson
R	FORESTRY CABIN	Polecat
R	LOOKOUT POINT	Porcupine
R	SPEEDER HOUSE	Coalspur
Bl	BOAT LANDING	Willow Pt.
R	RANGER STATION	Brule
R	LOOKOUT TOWER	Luscar
Bk	BUILDING	
R	BOAT STORAGE	B Watino
R	FLOAT LANDING	
Bl	ROCKY MOUNTAINS FOREST RESERVE BOUNDARY	

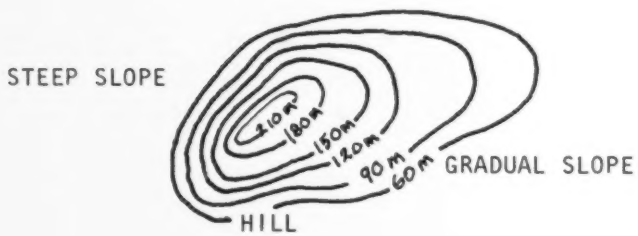
CONTOUR LINES

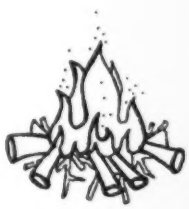
Contour lines are the thin brown lines running over the surface of the whole map. They connect areas of equal elevation. If you follow along one of these lines, you will find a figure (say 50). This represents the elevation, or number of metres above mean sea level, of all points along that line. In other words, if the sea were to rise 50 metres this contour line would mark the new shoreline at mean tide.

The vertical distance between any two contour lines on the 1:50,000 maps is either 10 metres or 20 metres; on the 1:250,000 maps, 50 metres. This contour interval, as it is called, is recorded on the map border, usually in the lower righthand corner.

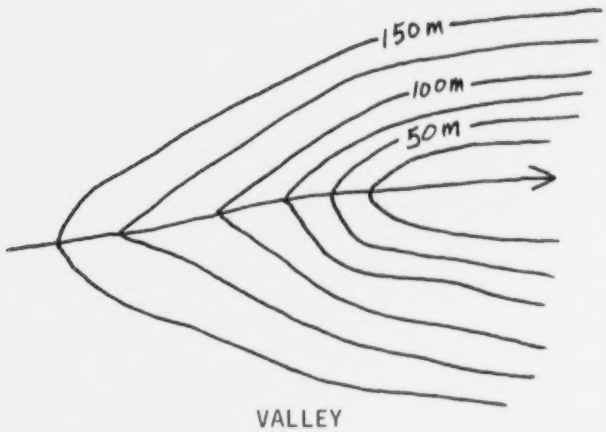
A great amount of information can be read from the patterns made by contour lines. Hills, for example, are present wherever there is a pattern of lines "nested" one within the other, with the elevation figures increasing toward the middle.

CONTOUR LINE FEATURES





Valleys are indicated by the same pattern, but here the height values decrease inward. Steep slopes are indicated by close-packed lines, gentle slopes by wide-spaced lines. Obviously, a study of contour lines can be just as important in planning a hike as can a knowledge of the locations of obstacles such as swamps or lakes.



VALLEY

A simple demonstration of how contour lines work can be prepared with a large rock.

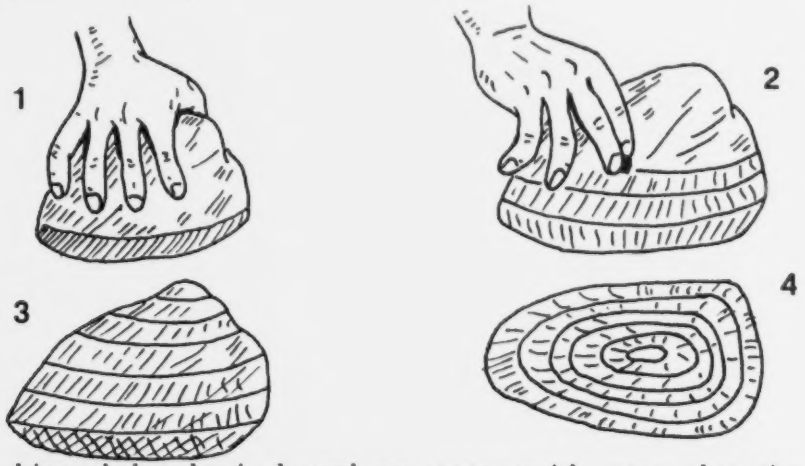
1. Choose some point on the rock as the "top", dip this part in water to a depth of 2.5 centimetres or so, take the rock out, and

2. mark the water-line with felt pen,

3. continue to dip the rock, going 2 centimetres deeper each time, and marking each successive water-line.

4. When you have finished, look down on the top with one eye, and imagine the rock as a hill.

The lines you now see indicate how the contour lines of such a hill would appear on a map.



Besides giving land elevations, topographic maps also show the elevations of certain lakes. This information is given as an exact height above mean sea level, in metres, and is normally printed within the lake area. On small lakes, the numbers may appear outside the water area, but in this case will be printed across any adjacent contour lines. This is to prevent their being confused with land elevations.

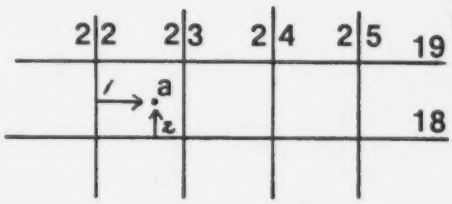
For closer work on maps of larger scale, a finer network of grid lines is needed. So in general navigation, the degrees are further divided into minutes (60 per degree) and seconds (60 per minute), which allows for very precise location of points. A second method - the one to be used by us - relates all points to an overprinted grid of numbered lines that are spaced at some interval suitable to the scale of the map being used. This grid which is independent of the traditional latitude-longitude network, is called a Universal Transverse Mercator Grid, and is commonly used in military mapwork with topographic sheets.

On the 1:50,000 maps, the grid lines are spaced 1,000 metres apart. They are numbered consecutively from west to east, and south to north. By using the numbers of any pair of intersecting lines, plus an estimate in tenths of how far the feature under study lies east and north of the last two lines, any map position can be accurately described. Such a description is in the form of six figures - three for latitude and three for longitude, with the last number being estimated in each case.

MILITARY GRID SYSTEM

Method of finding location using Military Grid System:

To find location A:



1. Locate nearest vertical line (easting) to the left of objective - 22.

2. Estimate in tenths the distance from line 22 (seven tenths). Hence 227.

3. Find the nearest horizontal line (northing) below objective - 18.

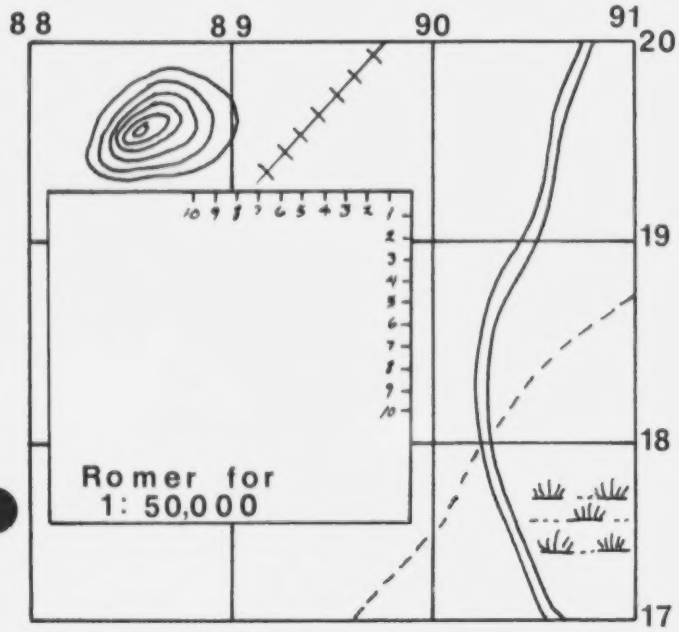
4. Estimate in tenths the distance from line 18 (five tenths). Hence 185.

5. The six figure reference is expressed: 22 71 85 accurate to within 100 metres.

When estimation will not give an accurate enough answer, a Romer is used for finding the third figure in map reference. It is simply a square of cardboard showing tenths of any given grid. To make one, cut out from bristol board a 5 cm x 5 cm square, and fit it into the upper right-hand corner of any grid square on the map. Mark where the first grid line crosses the north and east edges of your cardboard. Then divide into 10 equal parts the two distances so set off, and number them from one to ten each way, with zero at the corner. Next, label the Romer with the scale of the map from which it was drawn. Finally, to make the cardboard durable, apply a coat of shellac to both sides.

USING A ROMER

To use the Romer, place the corner marked zero (pointing north-east) on the object to be coded. Keeping the corner there, align the Romer so that its north and east sides are parallel with the corresponding grid lines.



The tenths are now read off where the grid lines meet the Romer graduations. All 3 east figures are read at once, then the three north figures. Together, they define the location of the object at the corner of the Romer. An easy way to remember the proper order of the figures is to use the mental picture of "go in the door (moving east) and up the stairs (meaning north)."

On maps without grid lines, reference can be made by using prominent names and a protractor, e.g. "river junction one centimetre N.W. of the Post Office". This is easier to write, but may take time to find if the person is not acquainted with the map.

Map Directions

Maps are usually drawn with the top of the map being north, but this is not always so. In any case, somewhere on the map will be an arrow indicating true and magnetic north. On the national topographic maps, the left and right edges of the map point true north and south. Also, the grids are aligned with true north and south.

Ordering Maps

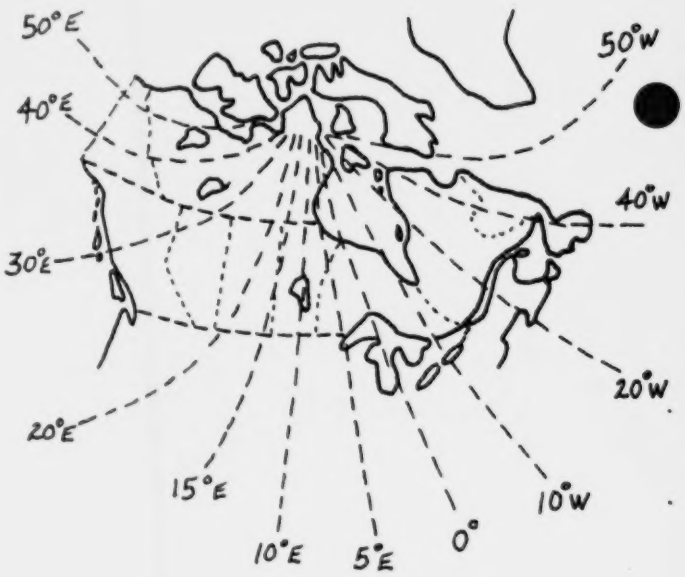
For easy reference, Canada is covered with a grid which is divided into numbered sections. Each section is divided into 16 lettered segments. These are further divided into 16 numbered parts, and each of these has an east and west half. The large number, the letter, and the small number, plus the east and west designation, are used in ordering maps in the 1:50,000 series (e.g. 21 D/14 West Half). Maps of other scales are now ordered using these same figures and letters; except that in the smaller scales (e.g. 1:100,000) segments are divided into 4 parts: NE, NW, SW, SE. A sample number is 21 D NE. In the 1:200,000 series, the lettered segment becomes the whole map sheet; a sample number is 21 D.

Orienteering

Once you have mastered the use of a compass and understand how to read a map, it is time to combine the two. Using them together for travelling through unknown territory is rapidly becoming the thrilling sport called ORIENTEERING. It is particularly popular in Europe, where regular competitions are held. Contestants plot courses and follow bearings to reach certain pre-determined points, often against a time limit. This requires a high degree of skill in all phases of map-and-compass work. Such skill comes from a sound grasp of all the basic principles, and much practice; but it is not beyond the reach of the average person.

MAGNETIC DECLINATION

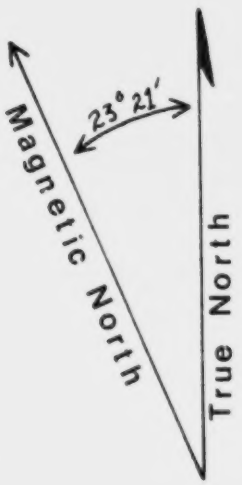
One of the first principles of map-and-compass work has to do with MAGNETIC DECLINATION. This refers to the fact that though a compass needle always points northward it almost never points toward the True North Pole. It ordinarily aims itself at the Magnetic North Pole, and is located 22,500 kilometres south of the true pole. Since map meridians run toward the true north and south poles, "compass north" and "map north" will be quite different in most parts of Canada. In fact, the farther you are east or west of a line joining these two poles, the greater will be the angle of declination between magnetic north and true north.



Consider what happens if you disregard this correction in an area with a magnetic declination of 23° West. In walking 0.6 kilometre on the uncorrected map bearing of, say 0° (e.g. true north), you will, by following the compass needle, actually be walking 23° to the left of your intended course, because you would be heading toward what the compass calls north; namely the Magnetic Pole.

In that distance, each degree you are off will put you 28 metres off-course. So in this example, for each 0.6 kilometre travelled on the uncorrected bearing you will be about 640 metres off. The same will apply to any other uncorrected azimuth bearing taken from a map, although the amount of the error will vary in different regions.

To correct an azimuth bearing taken from a map, simply add the correct declination to it before starting off. Then, although you will be using the Magnetic Pole as your reference, it will be as if the True North Pole was the reference. You will have, in a sense, "set your compass ahead to map time". Of course, if you happen to be west of the Magnetic Pole (roughly, west of Lake Superior, it will be necessary to subtract whatever declination applies there.



Since declination changes from place to place it is one of the first items to check on any map you plan to use. It will usually be printed near one of the bottom corners, and given either in words or (on large-scale maps) as a pair of arrows meeting at an angle equal to the declination, or on a smaller-scale map as a diagram showing bands of equal declination in the map area. Use the value given, and do not try to take the declination directly from the diagram.

One more point about declination needs mention. It changes a little from year to year in any given area. This means in effect that the Magnetic Pole is not constant in location. And this, incidentally, is why maps are drawn using the True North Pole as their standard reference point. Unlike the Magnetic Pole, its location remains virtually constant, century after century.

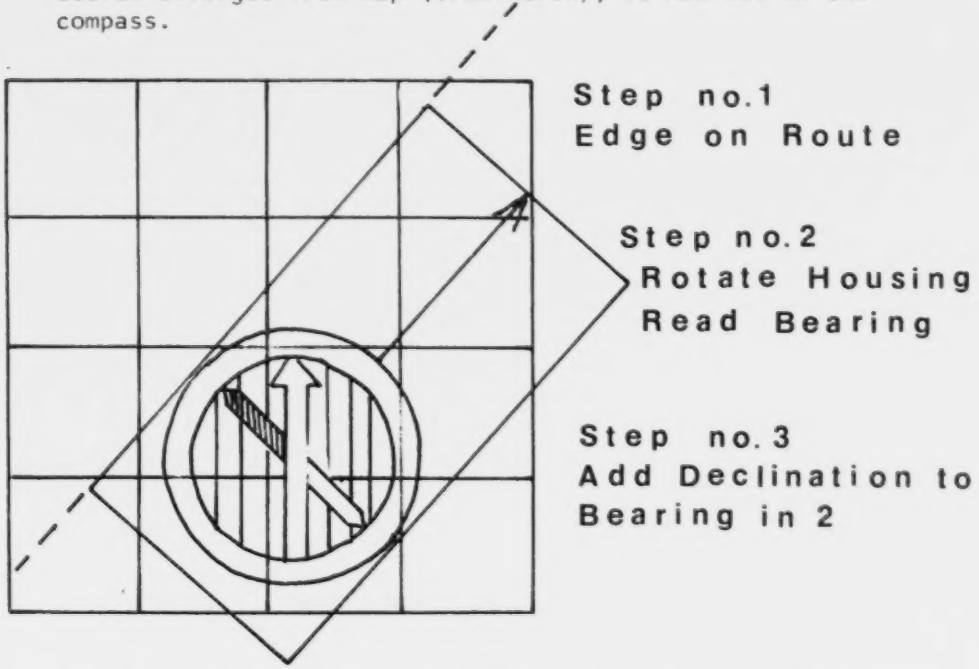
Because declinations change yearly, it is sometimes necessary as when using older maps to correct for the change. For example, if the declination was 23° to 45' West at a certain place on a 1950 map, and was decreasing 2' annually, by 1970 it would be 23° 5' West or 40' less. Since most hand compasses will not adjust closer than one degree, this change would result in a declination setting, after rounding off, of 23° instead of 24° - enough to put one well off course on long bearings. The rate of declination-change varies in different places from one to two minutes a year, and this is usually noted on each map. Remember that 60 minutes (60') equals one degree (1°).

TAKING A BEARING

There are 4 steps to follow when taking and following a bearing using a map and Silva compass.

STEP 1: Place the side of the compass base plate along the line joining your starting point and destination, with the direction-of-travel arrow pointing at your destination.

STEP 2: Holding the base plate firmly on the map, rotate the housing until the compass meridian lines are parallel to the north-south grid lines on the map. Disregard the magnet needle at this stage. Your bearing - that is, the angle by which your course diverges from map (true north), is now set on the compass.



STEP 3: Add to this true bearing the correct declination, (in western Canada subtract), and reset your compass. This larger bearing represents the angle by which your course diverges from magnetic north.

STEP 4: Holding the compass level, orient yourself so that the magnetic needle is aligned with the orienting arrow, sight on a landmark, and begin walking to your destination.

If your instrument is not an orienteering compass of the Silva type, bearings will have to be measured with a 360° protractor. To do this, proceed as follows:

STEP 1: Mark your proposed line of travel on the map - it will intercept some of the north-south grid lines.

STEP 2: Placing your protractor on the starting point, move it until its zero-degree and center-marks are aligned with those north-south lines.

STEP 3: Read your true bearing at the point where the proposed line-of-travel crosses the protractor edge.

STEP 4: Add to the bearing found in Step 3 the correct declination.

STEP 5: Orient the compass so the needle is pointing north, sight over its center post and across the bearing found in STEP 4. Choose a landmark, and proceed toward the destination.

NOTE: With the "Surveyor's Compass", which has no moveable housing, but has a direction-of-travel line, the procedure of sighting is to turn oneself until the north end of the needle is over the proper bearing, and then to sight along the direction-of-travel line to the first landmark. To permit sighting in this matter, the surveyor's compass has its "E" and "W" markings interchanged.

ORIENTING A MAP

In the course of your travels, it may be necessary to orient your map so that you can identify certain objects or landmarks. This may be accomplished in one of two ways:

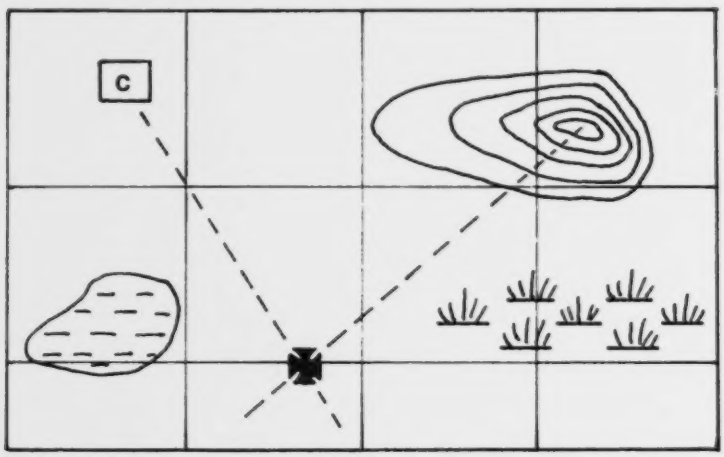
1. By finding two or more objects that can be seen both on the map and in your actual surroundings, and orienting the way by them.

2. By setting the declination on the compass, placing the base plate on a meridian or edge of the map, and turning map and compass as one until the orienting arrow and needle line up.

The preceding pages have set forth the main things you need to know about the use of the compass and map in woods travel. Should you wish to learn more, your group leader has information on where to obtain inexpensive booklets on the subject. With practice you will gain proficiency, and in time you will be able to travel as confidently and safely in strange territory as on familiar ground.

DETERMINING YOUR LOCATION ON A MAP

1. Determine the location of two visible landmarks on the map.
2. Take azimuth bearings on these landmarks and draw these.
3. Where they intersect, that is your location.



NOTE: Maps may be ordered from either the Department of Mines, Provincial Building, Halifax; or the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa. When ordering a 1:500,000 series map, request that it have the 1,000 - Metre Universal Transverse Mercator Grid printed on it.

Game Management

Game Management has been defined as "The art of managing land so that it will produce an annual harvestable crop of game for recreational use". It is important to notice in this definition that we actually manage not wildlife but land. A wildlife manager tries to create or maintain land and the plants growing on it in such a condition that it will provide a satisfactory place for wildlife to live and reproduce.

Most of our land today is used either for agriculture or forestry but often it is possible to manage this same land so that it will also produce a crop of game.

THE DEVELOPMENT OF GAME MANAGEMENT

The First Step - Game Laws

Eventually it was seen that game which "just grew" could not stand the increasing gun pressure. Governments have tried to save their game birds and animals by laws. Game laws are restrictive or prohibitive in nature - they tell how, how much, when, and where game may be taken. The use of laws in an attempt to save game is the first step in the evolution of game management.

The effect of game laws often is merely to divide up the dwindling supply among more and more hunters. Laws are necessary but in themselves do not increase or even preserve game. This short-coming was soon recognized and other ideas for game management were tried.

For Group Discussion Or For Members To Learn:

- Who owns wildlife?
- Who is responsible for the management and harvesting of game?
- Kinds of protection that should be given to wildlife.
- Reasons for laws that limit season, impose bag limits, limits kinds of guns used, etc.
- Danger of over-population in non-game wildlife.

ACTION TIME

Select two game species found in your area and tell the current game laws governing the hunting of them. Give reasons for the laws.

The Second Step - Predator Control

Human hunters through the ages have observed that predatory animals such as wolves, cougars, foxes, and sometimes hawks often take the same animals that man wants himself. So years ago and even today, predator control campaigns have been carried on with hope that more game for the hunter's pocket will result. This was the second step in the evolution of game management.

Evidence shows that bounties are useless as a game management method. Most scientific studies on predation show that predators feed upon surplus animals - whether mice or rabbits - that exist in excess of what the land will support. Normal predation is a natural condition that rarely causes game shortages. Predator control does not increase small game where the game food and cover are not good in the first place.

For Group Discussion Or For Members To Learn:

- Meaning of "predation".
- What are some of the common predators in your area: What do they eat?
- The role of predators in the wildlife community.
- Bounties - are they necessary? How effective are they?

ACTION TIME

- Make a list of common predators in your area and what they eat.
- Debate: "Resolved that bounties on coyotes, foxes and racoons are necessary to insure a proper balance of game animals".

The Third Step - Game Refuges

It was natural that the land game lived upon (game habitat) should be thought of next. If good habitats sheltered and produced game, why not preserve the habitat? Suitable area of game habitat could be completely closed to hunting. Excess game could flow out into surrounding area and the entire region would benefit from the closed area. Thus the idea of the refuge, the third step, was developed. The refuge is a game management device of great importance. Without refuges, game restoration programs are not likely to succeed; but a mere boundary of wire and placing of signs is not a cure-all for game shortage.

The refuge must consist of suitable habitat which will not only give protection to the animals but provide feeding, breeding, and nesting areas.

Publicly owned refuges are essential to modern game management; but we must also give attention to game on private lands.

The Fourth Step - Artificial Propagation (game farming)

Since our game laws efforts at predator control, and refuge systems did not restore game to its early abundance, it was natural that game farming should be tried. This was the fourth step in the evolution of modern game management. The idea had already been tried in Europe perhaps centuries before the idea of game farming was thought of in America. To supplement natural production the European shooting estates often released hand-reared game birds just before the shoot.

The purpose of such releases is two-fold:

1. to bring in foreign game birds to replace the native game birds driven out;

2. to increase the game population by stocking vacant areas or adding to the birds already present.

On the basis of very few hand-reared birds recovered and high costs reported from careful studies, it is impossible to justify a large scale rearing program. Most claims implying that artificial propagation is a profitable or effective means of increasing game supplies are not supported by facts. Artificial birds may be of value in stocking suitable habitat where native birds at one time existed but are now gone or very scarce. However, in view of the years of unsuccessful efforts in stocking, much depends upon what is "suitable" habitat.

We have tried to solve the problem of wild game production by restrictive laws, predator controls, refuges and game farming.

Even today Alberta uses parts of all phases in the wildlife conservation program. Laws will always be necessary and refuges are essential. These important elements have been discovered through trial and error methods - and these same methods show that predator controls and game farming do not increase game supplies.

The Fifth Step - Game Management On The Land

As wildlife biologists started to enter the picture about 1939 their first job was to critically examine the results of game laws, the hit-or-miss predator controls, preserves, and game farming ideas. The facts revealed by the wildlife technicians have been accepted only by degrees. It is hard for some people and some areas to discard old ideas.

The biologists have revealed many truths about wildlife. Most important of these is: wildlife is a crop of the land. When forests are cut, grasslands plowed and marshes drained, the native vegetation is destroyed which once was home for wildlife. Birds and animals are driven away to more suitable areas. Other forces such as hunting pressure are

added to loss of their habitat. Even with laws, predator control, and restocking, game dwindles to mere remnants of the former abundance. Old-timers note that game is not what it was when they were boys; true, but today we have more people, more tractors, more highways, more drainage ditches, and more livestock.

The number of game animals and birds can't stand up against the changes forced upon the land by modern society unless more attention is given to the land that produces game. The basic need for preservation of wildlife is to make land more productive for wildlife. This is the final step in the evolution of game management.

Working with the land presents the greatest opportunity for increasing wildlife numbers. Fortunately, but very logically, good land management practices benefit wildlife also. Unfortunately the knowledge of good land use from the standpoint of erosion control and soil and wildlife management is far ahead of actual practice. Management of land for wildlife is limited by other uses of the land. Even on agricultural land, wildlife management possibilities vary according to the kind of crop grown. For example, in areas of very fertile soils intensively cultivated for production of human food, the economic returns from the food crop eliminate the use of such land for wildlife. After all, the production of human food is more important to man's existence than wildlife. Fortunately there are ways to encourage wildlife on almost all land except that most intensively cultivated.

Developing A Wildlife Area

This activity will depend in part, on the availability of a suitable area on which the work can be conducted. This activity could be carried out over a period of several years. The suggested steps would be as follows:

1. Obtain the permission of the land owner to implement certain wildlife practices that would improve the land as game habitat. The area might be a farm or other tract of land suitable for management.

2. Map the farm or land - showing the wildlife habitat and areas where game might be found.

3. Decide what kinds of management practices might improve the area for game. These might include such things as:

   - Fencing stock from woodlands and wetlands,
   - Building brush shelters,
   - Planting suitable trees and/or shrubs for food and cover in odd corners for fencerows,
   - Establishing food patches,
   - Conducting winter feeding,
   - Erecting suitable houses for wood ducks, owls, song birds and squirrels.

4. Have work days to implement the program.

When setting up your wildlife area remember that no wildlife exists in a vacuum.

Each species or kinds of wildlife has certain requirements for it to live and reproduce successfully. These requirements differ with each kind of animal, depending on its specializations or adaptations. In general, animals with similar requirements tend to live in similar areas or habitats.

The animals and plants that live together in these areas constitute a wildlife community. An example of a wildlife community is a cattail marsh, where one would find ducks, coots, muskrats, mink and red-winged blackbirds all living together in the same kind of area. Farmland is still another kind of wildlife community. It provides a home for pheasants, meadow mice, ground squirrels, red-tailed hawks, rabbits, meadow larks, and other forms of life.

We must understand that every kind of wildlife belongs in a particular wildlife community made up of both plants and animals. This knowledge will provide us with a deeper appreciation of wildlife and what must be done to conserve the resource.

Hike Themes

The following list of nature hike themes is designed to present general ideas concerning the types of hikes that you can develop. The examples are strictly informational. You have complete freedom to bring in what details you want pertaining to each of them.

1. Geology of the Park

Stress the general landform and the chronological sequence of the geological events that shaped our area you see today. It is advisable to present the above geological sequence in brief summary form before the hike to accentuate the order of the geological events that took place.

On the hike, emphasize the prominent geological features, name rock formations, indigenous rocks and minerals, erratic rocks and minerals (glacial drift), the formation of igneous sedimentary and metamorphic rock (when samples are seen), fossils of the park and other geological factors that relate to the overall story.

In many instances it will be possible to relate the observable features in chronological order along the trail, especially if the trail goes uphill passing from older to younger rock out-croppings along the way.

2. Plant Succession (The Ever-Changing Plant Community)

This complicated ecological story is best presented by choosing a forest succession theme (most of our parks are forested). A general summary of the changes that take place from the pioneer forest of aspens and birch through the sub-climax oaks and hickories to the climax, maple-basswood stands should be presented at the beginning of the hike.

If other good examples of succession are available along the trail, such as pond, marsh or open field succession, they too may be used to illustrate the plant community changes that take place.

3. Trees and Shrubs

This hike theme should be aimed at the identification of trees and shrubs of the park. Whenever possible the use of these plants by white man and Indian should be stressed. Their use by birds and other animals should be pointed out when important species are encountered. Stress the aesthetics of their general form, leaf shapes, fall colours, etc. emphasizing that all plants are important to man in many different ways. When flowering or fruiting, these things should be pointed out as many people have never looked closely at the flowers of our common woody plants.

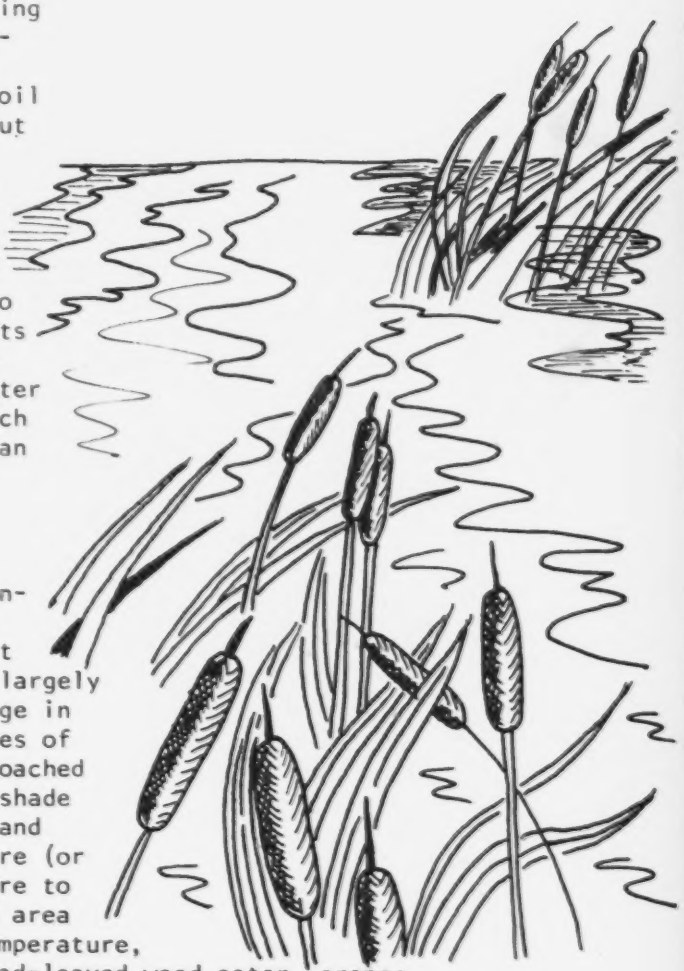
4. Plant-Animal Communities

Plant communities are constantly changing in species composition and as the plant varieties change - so also do the animal varieties that are dependent upon specific plants for survival. Find a few examples along the hike.

On the trail a field community can be compared to a forest community since there are such obvious differences in plant and animal life in the two communities. Find related plants and animals of the field and forest and indicate their differences in form, colour, habits, etc., as related to the two habitat types, e.g. Kingbird-wood peewee, marsh hawk-Cooper's hawk, spermophile-chipmunk and squirrels, prairie chicken-ruffled grouse, field asters-wood asters, march anemone-woodanemone, redosier dogwood-gray dogwood, etc., endless comparisons are possible.

5. Soils, Soil Formation, and Erosion

Soil types along the trail can be discussed using as divergent types as can be found, e.g. clays, silts, sandy loams, sands and gravels. Stress structure, organic matter and moisture holding capacities and bring in the effect plants have on developing soils. The roles played by burrowing animals in keeping the soil in good condition can be brought out by using ants, earthworms, foxes, skunks, woodchucks, etc. Discuss chemical, climatic, physical, and lichen breakdown of rocks in soil formation and accumulation. Point out examples of erosion and ways to stop it or slow it down, and effects if not controlled. Emphasize that erosion occurs continually in greater or lesser degree, no matter how much vegetation and leaf litter covers an area.



6. Plants Change Their Habits

Introduce this hike by explaining very simply the principles of plant succession and stress that it is the plants themselves that are largely responsible for the continual change in community composition, e.g. examples of increasing shade as climax is approached (aspen-oak-hickory-maple-basswood shade tolerance) increasing leaf litter and soil humus, increasing soil moisture (or decreasing moisture from hydrosphere to mesosphere if aquatic or wet marsh area is observed), decreasing ground temperature, etc. Point out plants such as broad-leaved wood aster, orange hawkweek and bracken fern that manufacture "herbicides" to help them invade new areas. Emphasize that though it is apparent that many species tend to destroy their optimum habitat, new opportunities to disperse present themselves after many natural catastrophies.

7. Plant Uses By Man

The physical and chemical properties of hundreds of species of plants were known to Indians and pioneers. Present day man is investigating and using these properties at an ever-increasing rate. The hike can be aimed at comparing uses of certain species by Indian and white man, e.g. hickory, white oak, ash, white cedar, white birch, basswood, duck potato, Indian hemp, nettle, leatherwood, bracken fern, etc. The modern use of many species for their chemicals can be discussed, e.g. hemlock - tennin; balsam fir - oil of balsam; trees in general - plastics; pine - patches and tars; goldthread - coptine; mints - mintoils, etc. Ornamental or landscaping uses may be stressed. The uses of certain species for erosion control, sand blow control and wind breaks or game cover can be elaborated upon. Stress future uses after plant breeders and horticulturists have worked on many wild species.

8. Scientific Names - Why?

A short hike can be taken, at which time common plants and animals can be observed, and their common name(s) and scientific name given. Species should be chosen that have easily understood scientific names, e.g. those names etymological roots are common in everyday language (trifoliata, duodecempunctata, lobata, cristate, Virginiensis, etc). The hike should begin with the explanation of the reasons for scientific names, e.g. international language among scientists, reflects relationships of organisms of each other (distant and close relatives), many individual species have a large number of common names but only one scientific name. This theme can be informative and is more interesting than you'd think!

9. Why Preserve Animals, Plants and Land Forms?

Many people (realtors, construction company officials, heavy equipment operators and industrialists) tell us that we can survive without natural areas and natural beauty. This is completely false and many of these people know it! Man is still basically an animal and has developed over most of his history on earth in close association with nature. His behavior and general physical and mental health will be seriously impaired if he is completely out of contact with nature.

A broad sense of values is necessary for optimum enjoyment of life and this cannot be attained without appreciation of natural beauty, diversity and the dynamics of our natural world. Choose items along the nature trail and ask yourself what the world would be like if it were not for trees, mosses, shrubs, flowers, ferns, grasses, mammals, songbirds, reptiles, amphibians, fish and the great variety of smaller animal forms. Use jutting headlands,

forested valleys and slopes, open fields of waving grasses and colourful wild flowers, bird songs, and clear springs, creeks and lakes to make your points. A good point to make aside from the aesthetics of all the above items is that all animals and plants are end products of thousands and millions of years of evolution (trial and error development) and as such are in reality miracles of creation. Stress that man should not have the right to destroy a single species. The future will bring scientific research that will enable us to utilize thousands of our "lesser species" in countless ways. Therefore, these species must be preserved.

10. Balance of Nature

Explain in simple terms the meaning of the"Balance of Nature" at the outset of this hike. Stress the dynamics and ever-changing aspect of any natural wildland community and explain that species with high reproductive potentials are constantly being checked by their natural predators, disease, starvation, etc. Observe species along the trail that have high reproductive potentials and describe the natural agents that help keep them under control:

a)	Insects vs. other insects	-	songbirds spiders parasitic wasps abnormal weather
b)	Spiders vs. spiders	-	spider-hunting wasps songbirds frogs toads shrews
c)	Frogs vs. snakes	-	hawks mink otter racoon herons
d)	Reptiles vs. hawks	-	mink other reptiles bears racoons skunks (turtle & snake eggs eaten)
e)	Small mammals vs. hawks (especially rodents)	-	owls shrikes snakes weasels mink fox coyote badger

Stress that drastic changes in the balance occur after natural catastrophies (forest fires, tornadoes, droughts, floods, and disease epidemics) but that man causes greater catastrophies in wildland communities. By clear cutting, burning, plowing, bulldozing, spraying, and planting areas of cornfields, alfalfa, hay and truck crops, man produces large amounts of natural foods which is often followed by a buildup of natural controlling predators. Non-selective spraying kills everything and can throw the balance far out of line. Emphasize that man is beginning to do research on biological control which is more in line with natural balance. Plants can be used as illustrations of this too. Using one type of plant crop in certain areas can lead to soil depletion and the subsequent artificial fertilization of the soil. Natural, slow changing "balanced" communities may not need fertilization, cultivation, irrigation, spraying, etc. Man will throw balance off more and more as time goes on and more land is brought under his control. He must seek to utilize natural controls and balances if we are to live in a world of great beauty and diversity.

II. <u>The Nutrient Cycle (Birth, Growth, Death and Decay)</u>

The introduction to this theme should emphasize that the soil, water, and air are the basic sources of all elements and compounds (nutrients) that form "building blocks" for plants (directly) and animals (indirectly). As soon as a seed germinates or an animal is born the nutrients that are used by these organisms for growth begin to get "locked up" in the organism's body. This continues until maturity and eventual death. After this occurs the nutrients are returned to soil, water and air by action of bacteria, protozoa and general chemical breakdown. The hike should be designed to observe the ways these nutrients enter plants and are built into these living things. Animals can next be discussed relating their indirect relationship to the nutrients that originate in soil, water, and air. Plant and animal specimens in all stages of growth, maturity, death and decay may easily be observed and elaborated upon. Stress importance of the infinite number of "higher" animals whose digestive systems "unlock" the plant (and animal) nutrients and return them to the soil in contrast with the bacteria and protozoa of decay which must wait for living tissue to die. Emphasize that if it were not for decay the earth would long ago have been suffocated under a layer of dead organisms. Bring out the importance of earthworms and other soil burrowers in constantly mixing mineral earth, nutrients, and decaying matter plus allowing rainwater and air to penetrate a very permeable soil. Bring in the specialized function of the legumes in extracting nitrogen from the air and "pumping" it into the soil and the "pumping" action of maples and basswood as compared to coniferous trees. New nutrients are slowly added to soil by chemical breakdown of rocks and rock particles.

12. Nature's Food Chain

Bring out the fact, initially, that the plant kingdom is the broad base upon which the animal kingdom rests. On the trail start with a plant and work up through the possible chain of events that will convert the plant to foods for various animals and finally man, e.g. grass - aphid - aphid lion - ground beetle - partridge - man; nut - squirrel - man; leaf - leaf beetle - pheasant - man; seed - mouse - snake - bear - man. Stress that between each level or link in the chain there is a great energy loss due to the activities of each animal involved and man gets only a small percentage of the energy initially received from the plant by the first forage animal. Thus, the more directly man relies on plants for food the greater is the energy supply per given volume of food. A long food chain may be described by the following "species chain": leaf - caterpillar - icheumon wasp - dragon fly - robber fly - garden spider - spider wasp - robber fly - flycatcher - screech owl - barred owl - horned owl. You might carry a diagram of the "web of life" to show how food chains cut across food chains in the complicated inter-relationships of a community with many predator-prey species. An aquatic food chain can be interesting and can be shown easily if a rich pond is at hand, and you may actually be able to catch enough individuals in a single sweep of an aquatic net to show the following: underwater leaf - small aquatic larvae - dragonfly nymph - diving beetle - crayfish - bass - man; aquatic plants and algae - tadpole - crayfish - turtle - man. It is usually difficult to observe all links in the particular chain chosen and some will have to be described in detail. It is best to use relatively short chains when specimens are to be looked for.

Record Keeping

Purpose of Record Keeping

1. record of information
2. record of work done
3. learning how to keep records
4. record of club activities
5. record of achievement

What is a Good Record Book?

1. Completeness - If any part of a record book is not finished, it detracts from the rest.

2. Accuracy - Keep an accurate account of the costs involved to give your calculations some meaning.

3. Pictures and Illustrations - Add originality and interest to the records. At the Achievement or Visitors' Day you should display pictures of your project studies and of the project members and leaders in your record book.

4. News Section - This should include a record of 4-H activities at local, provincial, national and international levels. 4-H News should be collected throughout the year. When an item is clipped from the paper, the date and name of paper should be written onto the clipping.

5. Neatness - Neatness is important in completing your record book. However, it is understood that the record book is completed throughout the entire year and not just the day before the Achievement or Visitors' Day.

4-H OUTDOORSMAN RECORD BOOK

MEMBER'S NAME _____

ADDRESS _____

AGE _____ BIRTHDATE _____

NAME OF PARENT OR GUARDIAN _____

NAME OF CLUB _____

NAME OF CLUB LEADER _____

NAME OF PROJECT LEADER _____

NO. OF YEARS IN 4-H _____ NO. OF YEARS IN PROJECT _____

RECORD OF PROJECT MEETINGS

Project Meeting Date	Material covered about project	I put this new knowledge to use by:

SPECIAL ACTIVITIES PARTICIPATED IN

Field Days, Rallies, Fair, Etc.

DATE	KIND OF ACTIVITY	I TOOK PART BY:

Achievement Day Projects and Activities in the Outdoors

1. SURVIVAL CAMPING

Complete at least one of the following activities:

1. Present a logbook of your survival camping activities, including sketch maps, personal and group equipment lists, menus and food amount, descriptions of activities, weather, terrain, wildlife, and other information you may wish to add. Display in your outdoor kit.

2. Construct a survival kit which could be used on a survival camping trip and display this at Achievement Day. Label everything carefully. If there are some items that you cannot obtain, put in a piece of paper with the name of that item on it and the reason you would need it in a survival situation. When you take the kit on a camping trip, be sure to substitute the real article for the item written on the paper.

3. Complete this worksheet regarding survival kits. (Acknowledgement for this worksheet to Manitoba Department of Education.)

   a. What size container would be good for a survival kit? Why?

   b. How could you seal your survival kit to make it completely waterproof?

   c. Why is it important that your survival kit always be with you?

   d. How could you make sure that you and your survival kit will never be separated in an emergency?

3. cont'd.

e. What use could you make of the survival kit container?

f. Describe two ways in which you could waterproof some strike-anywhere matches.

g. Explain what hypothermia is and how to avoid it - causes, symptoms and treatment. Describe clothing to take along, food and shelter needed.

II. EDIBLE BERRIES

The Western provinces each summer provide an abundance of edible native berries. Display photos or draw and colour four different types of summer berries, using as a reference source, "Some Edible and Poisonous Berries of Manitoba, Saskatchewan and Alberta" available through:

Alberta Agriculture Pub. #283-06-1 - OR
Manitoba Department of Renewable Resources

All drawings should be labelled to help you readily identify them when you observe them in the bush.

NAME:

NAME:

NAME:

NAME:

III. POISONOUS BERRIES

Some native berries are poisonous and will make you ill if eaten or touched. To learn how to avoid these, identify four such plants and draw them below. Carefully colour them so that you will recognize and can avoid the plant when you observe it.

NAME:

NAME:

NAME:

NAME:

IV. STUDYING THE ENVIRONMENT

When you plan for your outings, you should also plan to take advantage of the chance for studying the environment. The following things might be kept in mind when planning:

1. The different things that can be seen along the way, e.g. animals, birds, insects,

2. Collecting data and observing what one encounters - sketch or photography,

3. Follow up procedures, activities - water analysis for pollution; develop a collection of photos of many animals; research.

You should consider, as well, that the only way you can be purposefully involved in studying the environment is through a program that not only provides education into these problems but also outlines and supports specific lines of action individuals or groups can take toward maintaining the environment. Experience shows that unless the second step is included, the interest and enthusiasm generated by exposure to the facts quickly fades.

Therefore, a summary of what was learned should be given by you to the rest of the club in the form of a report or talk, plus you should try to stimulate your audience into specific lines of action.

Examples of environmental studies are numerous. Your study could even include:

- discussing trapping with an oldtimer
- seeing a nature movie
- digging in the library
- a collection of reptiles

Here are some ideas for environmental study themes and hiking themes. Perhaps you'll want to use a theme from another unit or one you discover on your own. Choose one of the following topics and display an environmental study in your outdoor kit.

1. Make a study of and give a guided hike on the effects of camping and outdoor activities on some area. Make a study of the effects of the different types of camping on the environment.

2. Many of the natural laws and principles discovered and utilized by man in his modern inventions, were "discovered" and utilized by "Mother Nature" millions of years before man "inherited" the earth. e.g. camouflage - insects, spiders, frogs, reptiles, birds (many examples can be found); ambush - ambush bugs, crab and jumping spiders, snakes, frogs and toads; leverage - animal legs, arms and wings; flight - birds and bats (explain both and compare); gliding - birds and flying squirrels; hammer and wedge - woodpeckers; papermaking - hornets' and wasps' nests; radar - bats, rattlesnakes, drilling insects; food storage - beaver, honeybees, ants, mice, bluejays, etc; and anaesthetics - spiders.

3. Animal and Plant Adaptations (Designs for Survival)

The theme for this hike can be very well supported by countless examples on the nature hike. Begin the hike with general statements on adaptations that develop as a result of natural selection, or "survival of the fittest". Examples: Plants - taproots, shallow roots, heavy bark, leaf form, leaf structure (cutinized, hairy, thin), thorns, seeds, spores, thizomes, and stolons, poisons, chlorophyll vs. saprophytic and parasitic plants; Animals - speed, camouflage, chemical protection (skunk, bombardier beetles, toad), fangs, claws, mimicry, heavy hair, fan tails, keen vision, etc.

The list could be endless, but the examples should illustrate the simple fact that through an infinite number of "experimental" trials and errors, Mother Nature has developed and continues to develop new adaptations and new species. Stress the dynamics of nature! This is always a most interesting hike!

4. Nature's Sounds, Smells, Tastes and Textures

This theme is an interesting one for all groups, but is especially good for 4-H groups. It utilizes all the senses but sight, though sight will be an automatic part of the hike.

Smells can be easily worked into the hike by using mint plants, skunk cabbage, pine, balsam, and spruce needles, water hemlock, wild carrots, rich forest soils, and leaf litter, prickly ash berries (very cautiously), acorns, wind nuts, basswood flowers and leaves, waterleaf, cress, toothwart roots, red elm twigs or inner bark, wild onion, oxalis, lamb's quarters, hog peanut, cattail and duck potato roots, columbine nectar bulbs, etc.

4. cont'd.

Textures can be brought out by touching most anything but certain species are much better than others for this, e.g. cleavers, stems, depressed juniper, leather fern (marginal shield fern) vs. maidenhair fern, mullein leaves, erd elm leaves, jewel-weed leaves and stems, water shield stems, rosinweed and compass plant leaves, white birch bark, American hornbeam bark and trunk, tick treefoil seeds, mushroom caps and gills, etc.

This hike should arouse your interest in other characteristics of plants.

5. Nature's Living Calendar

Every living organism responds to the changes in seasons by changes in itself, in order to survive and reproduce. The detailed study of the time or date of these responses is the science of Phenology. Stress that most people are amateur phenologists when they observe the first robin to return in the spring or observe the first blossom of lilac, apple, rose, bridal wreath, etc. Farmers are professional phenologists in that they consider dates very carefully as they relate to planting, cultivating, and harvesting their crops. Studying seasonal changes in the form and behavior of plants and animals of wild communities tells the scientist much about what to expect and when to expect it in future years, thus phenology is an immensely valuable science.

No matter what the season when you lead this hike, you can observe any species with which you are thoroughly familiar and explain its present response to the current season. Then, you can explain its past responses and future responses throughout a calendar year and make this a very informative and interesting hike.

Explain how abnormally early or late seasonal changes might affect certain species and for this reason, the science of phenology deals in averages when determining dates of natural plant and animal responses.

6. Life on the Forest Floor

This theme can be easily elaborated upon a very short hike. Analyze the life found in the litter of duff layer of the forest floor. A number of stops can be made initially on the hike to look at the life on the forest floor. Then a few stops where the litter is torn apart to show and talk about the various forms of life found, e.g. spiders, beetles, millipedes, centipedes, springtails, earthworms, ants, crickets, slugs, snails, plant roots, and other underground structures, fungal mycelia, etc.

6. cont'd.

Show upper litter, partially decomposed middle and lower humus rich mineral soil and bring out the role the various animals and plants play in forming these stratified layers, along with bacteria and protozoa. Try to find a dead log or branch that is just about decomposed and stress nutrient cycle involved. A magic slate would be a handy device here for rapid sketching of organisms seen.

7. Mushroom Identification

This is a specialized theme in that mushrooms are difficult to identify but certain naturalists may have the ability to utilize this theme on a hike. It is important to have detailed study of mushrooms before anyone attempts to gather them for food. Look at them and enjoy their many colours and pleasing form and forget about eating them. Hundreds die annually in America and Europe because of mistakes in mushroom identification. Learn about their saprophytic habits, spore production and rapid growth when conditions are favorable. The hike is specialized, also, since it is most successful in late July through September when the greatest rainfall occurs. Point out their specific needs when "fussy" species are found, as many are very specific as to their habitat needs.

V. MAP AND COMPASS

1. Make a Romer for use on 1:50,000 National Topographic series maps printed with the 1,000 metre grid (as explained in text).

2. Choose a crossroads or landmark near the center of your club map. Mark it as point X. Take the reference number of this point, and record it in the appropriate blanks below (marked by an asterisk). Add or subtract as indicated. The results are new reference numbers. Using your Romer, plot these, and label them A to H as indicated.

Reference number of your crossroads or landmark

X.....*

A.....*	B.....*
+ 015047	+ 047051
_____	_____

C.....*

+ 041016

D.....*

+ 027974

E.....*

- 036034

F.....*

- 054022

G.....*

042986

Find the bearing and distance between the following points:

	True Bearing (Azimuth)	Distance
Point X-A	____ °	____ metres
Point A-B	____	____
Point B-C	____	____
Point C-D	____	____
Point D-E	____	____
Point E-F	____	____
Point F-G	____	____
Point A-X	____	____

Complete a simple food chain of your wildlife area. Answer the following questions:

a) What is a food chain?

b) Sketch a food chain in your area with description of the wildlife and habitat.

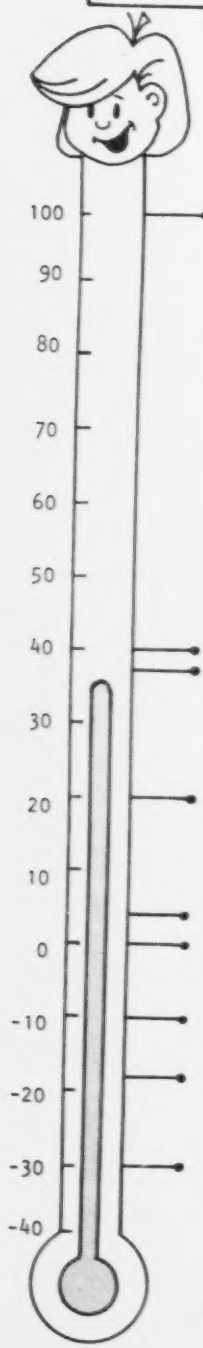
c) Include in your study:

- pamphlets, reference books
- a three minute talk on your study
- exhibits of your study.

METRIC MULTIPLES AND PREFIXES TABLE

Multiplying Factor	Prefix	Symbol
1,000,000 = 10^6	mega (meg a)	M
1,000 = 10^3	kilo (kil o)	k
100 = 10^2	hecto (hek to)	h
10 = 10^1	deka (dek a)	da
(Base Unit) 1 = 10^0		
0.1 = 10^{-1}	deci (des i)	d
0.01 = 10^{-2}	centi (sen ti)	c
0.001 = 10^{-3}	milli (mil i)	m
0.000,001 = 10^{-6}	micro (mi kro)	μ

(These prefixes may be applied to all metric base units.
Example: Base Unit = litre
Add kilo to litre (symbol kL) = kilolitre. The multiplying factor is 1000. This means a kilolitre equals 1000 litres.)



WATER BOILS (100°C)

HEAT WAVE (40°C)

NORMAL BODY TEMPERATURE (37°C)

NORMAL ROOM TEMPERATURE (21°C)

REFRIGERATOR TEMPERATURE (4°C)

WATER FREEZES (0°C)

LET'S SKATE ON THE POND (-10°C)

FREEZER TEMPERATURE (-18°C)

POSSIBLE CAR BATTERY TROUBLE (-30°C)

TOM THERMOMETER MEASURES TEMPERATURE IN DEGREES CELSIUS (°C)

TEMPERATURE: °F = 9/5 + 32
°C = 5/9 - 32

OVEN TEMPERATURES:

	°C	°F
Very slow	120-135	250-275
Slow	150-165	300-325
Moderate	175-190	350-375
Hot	200-220	400-425
Very Hot	230-245	450-475
Near boil	245-290	475-500

ADDITIONAL METRIC INFORMATION

from:

Metric Branch
Alberta Government Services
12th Floor, Park Square
10001 Bellamy Hill
Edmonton, Alberta T5J 3C1

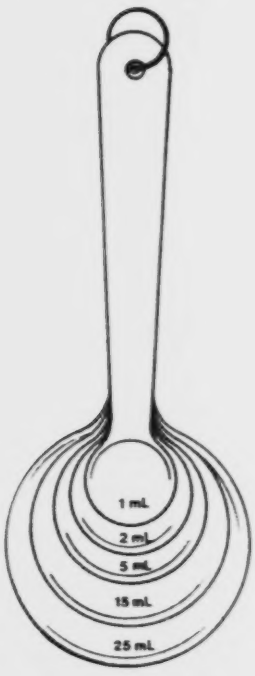
Metric Commission Canada
Box 4000
Ottawa, Ontario

Information Division
Canada Department of Agriculture
Ottawa, Ontario K1A 0C7

District Extension Office

OR

Publications Office
Alberta Agriculture
9718 - 107 Street
Edmonton, Alberta T5K 2C8



METRIC MEASURES ARE AVAILABLE IN THESE SIZES

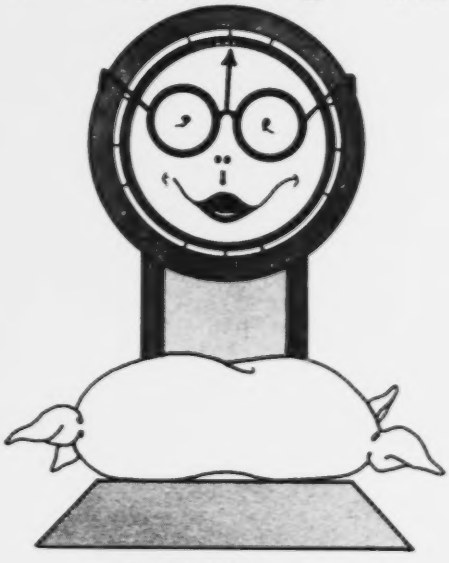
250 mL replaces 1 cup
500 mL replaces 2 cups

METRIC CONVERSION TABLE

Approximate Conversion to Metric Measures

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL	BASE UNIT
		MASS (weight)			
oz.	ounces	28.349	grams	g	
lb.	pounds	0.454	kilograms	kg	
ton	short tons (2000 lbs)	0.907	tonnes	t	gram
g	grams	0.035	ounces	oz.	
t	tonnes (1000 kg)	1.102	short tons	ton	
		VOLUME			
tsp.	teaspoons	5	millilitres	mL	
tbsp	tablespoons	15	millilitres	mL	
fl.oz.	fluid ounces	28.413	millilitres	mL	
pt.	pints	0.568	litres	L	
qt.	quarts	1.137	litres	L	
gal.	gallons	4.546	litres	L	litres
bu.	bushels	36.370	litres	L	
mL	millilitres	0.035	fluid ounces	fl.oz.	
L	litres	1.760	pints	pt.	
L	litres	0.880	quarts	qt.	
L	litres	0.220	gallons	gal.	
L	litres	0.027	bushels	bu.	
		LENGTH			
in.	inches	2.540	centimetres	cm	
ft.	feet	0.305	metres	m	
yd.	yards	0.914	metres	m	
mi.	miles	1.609	kilometres	km	
mm	milimetres	0.0394	inches	in.	metre
cm	centimetres	0.394	inches	in.	
m	metres	3.281	feet	ft.	
m	metres	1.094	yards	yd.	
km	kilometres	0.621	miles	mi.	
		ENERGY			
kcal	kilocalorie	4.186	kilojoules	kJ	joule
kJ	kilojoules	0.239	kilocaleries	kcal	

MUNSTER METRE
MEASURES LENGTH



SAM KILOGRAM
MEASURES WEIGHT

LILY LITRE
MEASURES VOLUME